



CAUSES OF WATER BORNE DISEASES AND PREVENTION IN INDIA

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ABSTRACT

Water borne diseases including cholera, Typhoid fever, Diarrhea, Ulcers, Hepatitis, Arsenicosis, Respiratory Tract Infection, Kidney Damage, and Endocrine Damages are very risky for lives of individuals and especially for humans ultimately leading to death. In India, over one lakh people die of water-borne diseases annually. It is reported that groundwater in one-third of India's 600 districts is not fit for drinking as the concentration of fluoride, iron, salinity and arsenic exceeds the tolerance levels. These diseases are mainly due to drinking water problems because of presence of different harmful bacteria and germs which may cause these drugs. The water treatment can also be used so no one can drink or use dirty or untreated water and can be saved from these effects.

KEY WORDS: Diseases, Water, Drinking, Harmful, Bacteria and Infection.

INTRODUCTION:

Towns and cities with an abundance of water struggle to manage the water efficiently, often leading to water collecting in potholes and or in the surrounding areas and going unused. This can have severe consequences as water-borne diseases, such as cholera, malaria and diarrhoea can spread as a result of improper management of the water supply as well as discharge. Looking at the figures, the Ganges provide water to over 500 million Indians - contamination of just one source of water could affect millions of lives in one go. Water contamination often occurs due to inadequate and incompetent management of resources as well as inflow of sewage into the source.

United Nations says that more than three million people in the world die of water-related diseases due to contaminated water each year, including 1.2 million children. In India, over one lakh people die of water-borne diseases annually. It is reported that groundwater in one-third of India's 600 districts is not fit for drinking as the concentration of fluoride, iron, salinity and arsenic exceeds the tolerance levels. About 65 million people have been suffering from fluorosis, a crippling disease due to a high amount of fluoride, and five million are suffering from arsenicosis in West Bengal due to high amount of arsenic. About 70 per cent of India's water supply is seriously polluted with sewage effluents. The UN reported that India's water quality is poor - it ranks 120th among 122 nations in terms of quality of water available to its citizens. Water-borne diseases like cholera, gastroenteritis and diarrhoea erupt every year during summer and rainy seasons in India due to poor quality drinking water and sanitation.

Water pollution travels slower than air pollution but still may affect large area. While the most common water pollution diseases involve poisoning episodes affecting the digestive system and/or causing human infectious diseases, water pollution may cause a large variety of health diseases including infectious diseases caused by pathogens (usually micro-organisms) from animal fecal origins, of which the most common occur in developing countries, including Typhoid, Giardiasis, Amoebiasis, Ascariasis, and Hookworm. Diseases caused by polluted beach water, including Gastroenteritis, Diarrhea, Encephalitis, Stomach cramps and aches, Vomiting, Hepatitis and Respiratory infections. Infectious diseases can be spread through contaminated water. Some of these water-borne diseases are Typhoid, Cholera, Paratyphoid Fever, Dysentery, Jaundice, Amoebiasis and Malaria. Chemicals in the water also have negative effects on our health. Pesticides can damage the nervous system and cause cancer because of the carbonates and organophosphates that they contain. Chlorides can cause reproductive and endocrinal damage.

REVIEW OF LITERATURE:

Review of selected literature is an essential part of every research process. It helps us to examine and evaluate what has been said earlier on the research subject.

Saxena, M.M., Chhabra, C. (2004) A status survey of common water-borne diseases in desert city Bikaner (NW Rajasthan, India). A study conducted on survey of common water-borne diseases in desert city Bikaner, Rajasthan. Water is scarce and, in general, a low quality resource in desert areas and the Indian desert is no exception. The present study was taken up to survey the status of common water-borne diseases epidemiological trends in the desert city Bikaner. In the city, 15.5 per cent population and 44.5 per cent families were found to suffer from one or more common water-borne diseases including amoebiasis, diarrhoea, dysentery, jaundice and typhoid.

Hamner, S, Tripathi, A, Mishra, R.K, Bouskill, N, Broadaway, S.C, Pyle, B.H, Ford, T.E. (2006) The role of water use patterns and sewage pollution in incidence of water-borne/enteric diseases along the Ganges river in Varanasi. A study conducted on The role of water use patterns and sewage pollution in incidence of water-borne/enteric diseases along the Ganges river in Varanasi, India. In Varanasi an estimated 200 million liters daily or more of untreated human sewage is discharged into the Ganges River. River water monitoring over the past 12 years has demonstrated faecal coliform counts up to 10(8) MPN (most probable number) per 100 ml and biological oxygen demand levels averaging over 40 mg/l in the most polluted part of the river in Varanasi. The overall rate of water-borne/enteric disease incidence, including acute gastrointestinal disease, cholera, dysentery, hepatitis-A, and typhoid, was estimated to be about 66% during the one-year period prior to the survey.

Atreya, K, Panthee, S, and Sharma, P. (2006) Bacterial contamination of drinking water and the economic burden of illnesses for the Nepalese households. A study conducted on Bacterial contamination of drinking water and the economic burden of illnesses for the Nepalese households. A household survey was conducted to determine the number of working days lost and household medical expenditure due to six water-borne diseases in the Terai region of Nepal. Drinking water sources of each household were analysed for total coliforms (TC). The study found 61% of the household water sources were contaminated with total coliforms at the time of sampling. Number of days lost due to water-borne diseases was 8 days for total coliforms TC-negative households and 10 days for TC-positive households per year.

Otaki, Y, Otaki, M, & Sakura, O. (2007) Water systems and urban sanitation: a historical comparison of Tokyo and Singapore. A study conducted on Water systems and urban sanitation: a historical comparison of Tokyo and Singapore. The importance of a water supply and sewage treatment for urban sanitation is recognized in the modern world.. In this research, we focused on the Asian cities of Tokyo and Singapore, which both developed significantly in the 20th century. We analyzed their development processes statistically to determine what the key elements for the protection of urban sanitation have been. Although both cities constructed modern water supply systems at almost same time (Tokyo in 1898 and Singapore in 1878), and similarly modern wastewater treatment systems (Tokyo in 1922 and Singapore in 1913), the prevalence of water-borne diseases in Tokyo was more serious than it was in Singapore, in spite of Singapore's high infant mortality rate.

MATERIALS AND METHODS:

The method used in this paper is descriptive-evaluative method. The study is mainly review based. It is purely supported by secondary source of data, i.e. books, journals, papers and articles and internet.

RESULTS AND DISCUSSIONS:

Diseases Caused by Polluted Water:

Poor water quality becomes inevitable when water gets polluted with industrial waste, human waste, animal waste, garbage, untreated sewage, chemical effluents, etc. Drinking or cooking with such polluted water leads to waterborne diseases and infections such as amoebiasis, giardiasis, and toxoplasmosis. Contaminated water could carry viruses such as Hepatitis A and E, bacteria like E.coli (E.coli can be passed from hand to hand, such as via vendors of street food or food handled by someone carrying E.coli bacteria. It can lead to food poisoning). Waterborne diseases include diarrhoea, dysentery, polio and meningitis and

typhoid. Unclean water for washing can cause skin and infectious eye disease such as Trachoma. Trachoma can lead to visual impairment or blindness. Rural populations are more at risk from waterborne illnesses, but everyone faces risks of polluted or contaminated water. Waterborne illness can affect anyone, anywhere. The risk is more for infants, younger children, the elderly and patients of diabetes, chronic diseases of heart disease, kidney, etc.

Over five years to 2017, water-borne diseases--cholera, diarrhea, typhoid and viral hepatitis-caused 10,738 deaths, latest government data show. Diarrhoea

remained the leading killer, causing about 60% of all deaths, according to this reply to the Lok Sabha (lower house of Parliament) by Jai Prakash Nadda, minister for health and family welfare, on April 6, 2018. India loses 73 million working days due to water-borne diseases, India Spend reported on June 21, 2016. India registered 69.14 million cases--or as many people as in United Kingdom--of four water-borne diseases over five years to 2017, govt data show. Diarrhoea caused 6,514 deaths, the most of water-borne diseases in India, over five years to 2017. Other killers were viral hepatitis (2,143), typhoid (2,061) and cholera (20).

Table 1: Reported Cases And Deaths By Water-Borne Diseases in India

Disease	2013		2014		2015		2016		2017	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Cholera	1130	5	844	5	913	4	718	3	385	3
Acute Diarrhoeal Diseases	11413610	1629	11748631	1137	12913606	1353	14166574	1555	9230572	840
Typhoid	1650145	387	1736687	425	1937413	452	2215805	511	1493050	286
Viral Hepatitis	110125	574	138554	400	140861	435	145970	451	98086	283

Source: Lok Sabha

Water borne diseases including cholera, Typhoid fever, Diarrhea, Ulcers, Hepatitis, Arsenicosis, Respiratory tract infection, Kidney Damage, and Endocrine Damage are very risky for lives of individuals and especially for humans, these can lead ultimately death. These diseases are mainly due to drinking water problems because of presence of different harmful bacteria and germs which may cause these drugs. These diseases can be cured with proper medications and treatment courses. Along the treatment, there are different ways to prevent from these diseases.

Cholera:

Cholera disease is mainly caused due to water pollution. In polluted, dirty and hard water, different bacteria are contaminated, which cause different diseases like cholera. Its symptoms include the stomach ulcer, severe dehydration, rapid diarrhea and sometimes, it ends with death. Main causes of the cholera are the bacteria available in polluted water, hard water ingestion containing cholera causing germs. Swimming in dirty unsafe water can cause cholera. Deficiency in stomach acid can cause to increase the risks for cholera disease.

Typhoid:

Typhoid fever is a type of enteric fever along with paratyphoid fever. The cause is the bacterium *Salmonella Typhi*, also known as *Salmonella enterica* serotype Typhi, growing in the intestines and blood. Typhoid is spread by eating or drinking food or water contaminated with the feces of an infected person. Other symptoms for typhoid are headache, stomach pain, loss of appetite, weakness, weight loss, constipation, and sometimes, internal bleeding through vomiting. Bacteria that can be found in polluted water, cause the typhoid fever in humans. Food that has been contaminated by either drinking contaminated water or being grown with contaminated water also a cause of typhoid fever.

Diarrhea:

Diarrhea is an increase in the frequency of bowel movements or a decrease in the form of stool (greater looseness of stool). Although changes in frequency of bowel movements and looseness of stools can vary independently of each other, changes often occur in both. With diarrhea, stools usually are looser whether or not the frequency of bowel movements is increased. This looseness of stool--which can vary all the way from slightly soft to watery--is caused by increased water in the stool. The main cause for Diarrhea is drinking water which is polluted with bacteria and chemicals. Without filtration and treatment, use of drinking water and foods without wash may increase the risks for diarrhea.

Ulcers:

Peptic ulcers are open sores that develop on the inside lining of your stomach and the upper portion of your small intestine. The most common symptom of a peptic ulcer is stomach pain. Peptic ulcers include: Gastric ulcers that occur on the inside of the stomach Duodenal ulcers that occur on the inside of the upper portion of your small intestine (duodenum). The most common causes of peptic ulcers are infection with the bacterium *Helicobacter pylori* (*H. pylori*) and long-term use of aspirin and certain other painkillers, such as ibuprofen (Advil, Motrin, others) and naproxen sodium (Aleve, Anaprox, others).

Hepatitis:

Hepatitis is inflammation of the liver tissue. Some people have no symptoms whereas others develop yellow discoloration of the skin and whites of the eyes, poor appetite, vomiting, tiredness, abdominal pain, or diarrhea. Hepatitis may be temporary (acute) or long term (chronic) depending on whether it lasts for less than or more than six months. Acute hepatitis can sometimes resolve on its own, progress to chronic hepatitis, or rarely result in acute liver failure. Over time the chronic form may progress to scarring of the liver, liver failure, or liver cancer. The most common cause worldwide is viruses. Other causes include heavy alcohol use, certain medications, toxins, other infections, autoimmune diseases, and

non-alcoholic steatohepatitis (NASH). There are five main types of viral hepatitis: type A, B, C, D, and E.

Arsenicosis:

Arsenicosis is a chronic illness resulting from drinking water with high levels of arsenic over a long period of time (such as from 5 to 20 years). It is also known as arsenic poisoning. The WHO recommends a limit of 0.01 mg/l of arsenic in drinking water. It results in various health effects including skin problems, skin cancer, cancers of the bladder, kidney and lung, and diseases of the blood vessels of the legs and feet, and possibly also diabetes, high blood pressure and reproductive disorders.

The symptoms of arsenic poisoning can be acute, or severe and immediate, or chronic, where damage to health is experienced over a longer period. This will often depend on the method of exposure. A person who has swallowed arsenic may show signs and symptoms within 30 minutes. These may include the drowsiness, headaches, confusion and severe diarrhea.

Precautions to prevent waterborne disease:

- Ensure the water is visibly clean and free from sand and silt. Filter the water to get rid of visible dirt.
- Drink only clean and safe water – either portable water or water filtered through water purifiers.
- Get water purifying devices like filters, RO unit, etc., regularly serviced and maintained.
- Ensure stored water is germ-free.
- Add antiseptic liquid, such as Dettol in dubious-looking bathing water.
- Hand hygiene – regularly wash hands with soap after returning home, after using the toilet, before and after preparing food, before eating or drinking anything.
- Teach hand hygiene to children. Children should make it a habit to always wash hands when returning home after playing games.
- Ensure food is washed and thoroughly cooked.
- Use disposable glass and plates whenever possible when eating outside food, particularly street food.
- Avoid eating stale cooked food, unrefrigerated food kept exposed outside for long hours.
- Take vaccinations for immunization against preventable diseases like Typhoid, Hepatitis A, Polio, etc.

CONCLUSION:

Water borne diseases including cholera, Typhoid fever, Diarrhea, Ulcers, Hepatitis, Arsenicosis, Respiratory Tract Infection, Kidney Damage and Endocrine Damages are very risky for lives of individuals and especially for humans, these can lead ultimately death. These diseases are mainly due to drinking water problems because of presence of different harmful bacteria and germs which may cause these drugs. The water treatment can also be used so no one can drink or use dirty or untreated water and can be saved from these effects.

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